

Abstract Submitted
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Flow equation holography STEFAN KEHREIN¹, University Goettingen — The Ryu-Takayanagi conjecture [1] about the holographic derivation of the entanglement entropy provides a remarkable geometric picture by relating minimal surfaces to the entanglement entropy. Underlying this conjecture is the AdS/CFT correspondence, which limits the applicability of this geometric picture in its original formulation to a very specific set of theories. In this talk I will show how the flow equation method [2,3] can be used to construct an emergent geometric picture for generic quantum many-body systems. Results for the emergent Riemannian geometry of certain low-dimensional quantum systems are presented based on analytical and numerical solution of the flow equations. Minimal surfaces on these Riemannian manifolds show behavior in agreement with the entanglement entropy of the corresponding quantum theory, both for gapped and critical systems.

[1] S. Ryu and T. Takayanagi, Phys. Rev. Lett. 96, 181602 (2006)

[2] F. Wegner, Ann. Phys. (Leipzig) 3, 77 (1994)

[3] S. Kehrein, The Flow Equation Approach to Many-Particle Systems (Springer, 2006)

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